

**U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: Calochortus persistens

COMMON NAME: Siskiyou mariposa lily

LEAD REGION: Region 8

INFORMATION CURRENT AS OF: April 6, 2006

STATUS/ACTION:

☐ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status

☐ New candidate

☒ Continuing candidate

☐ Non-petitioned

☒ Petitioned - Date petition received: 9-10-01

☐ 90-day positive - FR date:

☐ 12-month warranted but precluded - FR date:

☐ Did the petition request a reclassification of a listed species? No

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted? Yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes

c. If the answer to a. and b. is yes, provide an explanation of why the action is precluded. We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower listing priority numbers). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, emergency listings, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the 12 months, see the discussion of "Progress on Revising the Lists," in the current Candidate Notice of Review which can be viewed on our Internet website (<http://endangered.fws.gov/>).

☐ Listing priority change

Former LP: ☐

New LP: ☐

Date when the species first became a Candidate (as currently defined): 6-13-02

☐ Candidate removal: Former LPN: ☐

- ___ A - Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
- ___ U - Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or in total, to conservation efforts that remove or reduce the threats to the species.
- ___ F - Range is no longer a U.S. territory.
- ___ I - Insufficient information exists on biological vulnerability and threats to support listing.
- ___ M - Taxon mistakenly included in past notice of review.
- ___ N - Taxon may not meet the Act's definition of "species."
- ___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering Plant; Family: Liliaceae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California and Oregon

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Siskiyou County, California and Jackson County, Oregon

LAND OWNERSHIP:

Of the nine known occurrences in California, seven are entirely located on the Scott/Salmon Ranger District of the Klamath National Forest. Subpopulations of two other occurrences may be found on both Federal and private lands (Klamath National Forest 2001). The Oregon population occurs entirely within the Ashland Resource Area, Medford District of the Bureau of Land Management (Klamath-Siskiyou Wildlands Center 2001).

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BIOLOGICAL INFORMATION:

Calochortus persistens (Siskiyou mariposa lily) is an herbaceous perennial flowering plant with a single, wide, basal leaf, arising from a bulb. The persistent basal leaf is approximately 20 centimeters (cm) (7.9 inches (in)) in length and the stem approximately 10 cm (3.9 in) high. One to two large showy, pink to lavender, erect, bell-shaped flowers have a yellow fringe above the nectary at the base of the petals. Below the nectary on each of the three petals is a wide ciliate membrane. Sepals and petals are both 35 millimeters (mm) (1.4 in) to 40 mm (1.6 in) in length. The nodding three-winged fruit are approximately 1 cm (0.4 in) long and remain covered by the persistent sepals and petals (Hickman 1996; Overton 1979; Ownbey 1940). Ownbey (1940) described C. persistens as a new species from the type specimen collected by E.L. Greene (#903) on June 30, 1876, from the "mountains near Yreka", Siskiyou County, California. Hickman (1996) continues to recognize this species as it was named in 1940.

Calochortus persistens, a narrow endemic, is restricted to two disjunct ridge tops in the Klamath-Siskiyou Range, on the California-Oregon border. Two historical populations are known: the type locality on Gunsight-Humbug Ridge, west of Yreka, Siskiyou County, California, and the Bald Mountain site, west of Ashland, Jackson County, Oregon. In California, this species is currently found at nine separate sites on approximately 10 hectares (ha) (24 acres (ac)) of Klamath National Forest and privately-owned lands that stretch for 6 kilometers (km) (4 miles (mi)) along the Gunsight-Humbug Ridge. The Oregon population was described in 1998, as five plants in an area of a few square feet (Klamath-Siskiyou Wildlands Center 2001).

In California, Calochortus persistens occurs at elevations of 1,310 meters (m) (4,300 feet (ft)) to 1,847 m (6,060 ft) on ridgeline rock outcrops and talus, where the soils are shallow, dry, rocky, and acidic (Knorr 1987; Klamath-Siskiyou Wildlands Center 2001). These soils are well-drained early in the season after snow melt. Calochortus persistens plants are found in greater numbers on north-facing slopes and are not found very far down off the ridge (Knorr 1987). Soils on Gunsight-Humbug ridge are of metamorphic origin and belong to the Jayar Family/Woodseye Family Association (Knorr 1987; Klamath-Siskiyou Wildlands Center 2001). In Oregon, C. persistens is found at 1,585 m (5,200 ft) in McMullin Rock Outcrop Complex soils.

Calochortus persistens plants occur in openings where there is little vegetative cover and the litter layer is shallow or absent. Dominant shrubs are Cercocarpus ledifolius (curl-leaf mountain mahogany) and Cercocarpus betuloides. Berberis aquifolium var. repens (Oregon-grape), is another associate that can sometimes be dominant. Other common shrub species in the vegetative community are: Lupinus albifrons var. collinus, Quercus garryana var. breweri; Prunus emarginata (bitter cherry), Chrysothamnus nauseosus (rubber rabbitbrush), Ceanothus integerrimus (deer brush), and Garrya sp. (silk tassel bush) (1987; Knapp 1996). Down slope from this open shrubby vegetative community where C. persistens occurs, is mixed coniferous forest, dominated by Pinus ponderosa (ponderosa pine), Pseudotsuga menziesii (Douglas-fir), and Calocedrus decurrens (incense cedar).

In California, Klamath National Forest botanists have conducted surveys for Calochortus persistens in 1980, 1981, 1982, 1987, 1992, 1995, and 2003 (Knorr 1987, Klamath National Forest 2004). The 2003 survey yielded the greatest number of plants and is thought to be the most comprehensive survey to date. In previous years, the extent of each population and the number of populations that were surveyed were variable. In addition, many botanists have noted extreme variation in the number of plants counted from year to year, presumably as a result of environmental factors (Overton 1979; Knorr 1987; Klamath-Siskiyou Wildlands Center 2001). Klamath-Siskiyou Wildlands Center (2001) reported that in June 1995, all known California locations had been surveyed (in coordination with the Klamath National Forest) and estimated a total California population of 3,000 plants. More than 3,695 C. persistens plants were counted on Federal and some private lands in 2003 (Klamath National Forest 2004). Juvenile plants of all ages, indicated by single leaves of varying widths, were evident in all populations in the 2003 Klamath National Forest survey.

In 2002, Knapp reported that she had seen four C. persistens plants at the Oregon site (Barbara

Knapp, pers. comm., 2002). These were the first plants reported from that area since the population was discovered in 1998 (Klamath-Siskiyou Wildlands Center 2001). In 2003, only one plant was found in Oregon but in 2005, all five plants were found at this site (B. Tong in litt. 2004, 2005).

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Major threats include the introduction of exotic weeds and grasses; fire suppression resulting in increased fuel loading and shading and competition by native and non-native species; fragmentation by roads, fire breaks, tree plantations, and radio-tower facilities; maintenance and construction around radio towers and a telephone relay station located on Gunsight Peak and Mahogany Point; and soil disturbance and exotic species introduction as a result of heavy recreational use and fire break construction (Knorr 1987; Knapp 1995; Knapp 1996; Klamath-Siskiyou Wildlands Center 2001). In 2000, Isatis tinctoria (dyer's woad), a germination inhibitor (Young and Evans 1971), was reported to have spread throughout the California population (Klamath-Siskiyou Wildlands Center 2001). In 2001, U.S. Forest Service (Forest Service) staff considered that dyer's woad affected 90 percent of the known C. persistens habitat in California (Klamath National Forest 2001). A biennial, with a deep taproot, dyer's woad forms dense rosettes in infested areas. Dyer's woad is thought to prevent C. persistens seedling establishment by competing for space, water, and nutrients. Both Forest Service staff (Fish and Wildlife Service in litt. 2001) and Klamath-Siskiyou Wildlands Center (2001) cited competition with dyer's woad as a significant and chronic threat to the survival of C. persistens. After extensive surveys in 2003, Forest Service staff reported that while dyer's woad is a continuing threat to 90 percent of the range of C. persistens in California, the area covered by this exotic weed did not appear to exceed one to two percent of the habitat in each C. persistens subpopulation where dyer's woad occurred. Dyer's woad is not found in approximately 10 percent of the C. persistens habitat in California, presumably because absence of ground disturbance has kept dyer's woad from becoming established (Klamath National Forest 2004; Marla Knight, Forest Service, pers. comm. 2004).

The Gunsight-Humbug Ridge has one of the highest rates of lightning strikes and small fire ignitions on the Klamath National Forest (Knapp 1996). However, as a result of fire suppression, the last large fire in the area was the 1955 Haystack Fire. Fire suppression has resulted in shading and competition by native species including curl-leaf mountain mahogany and Oregon grape (Knapp 1995). Conifers appear to be encroaching as well (Knapp 1996). In addition to reducing habitat suitability through shading and competition, fire suppression may have resulted in an increased fuel load that could result in complete destruction of habitat, should a high-intensity fire occur.

Direct destruction of plants and habitat has occurred as a result of site maintenance around the Gunsight Peak radio installation in spring 2000 (Klamath-Siskiyou Wildlands Center 2001) and snow plowing to replace a power pole in the winter of 1999/2000 (Margaret Boland, Klamath National Forest, in litt. 2001). Road grading and controlled burning may also result in direct destruction of plants and habitat (Margaret Boland, Klamath National Forest, in litt. 2001;

Klamath-Siskiyou Wildlands Center 2001).

No private property development proposals in the area of the nine Calochortus persistens occurrences are on file with the Siskiyou County Planning Department (John Jarecki, Siskiyou County Planning Department, pers. comm., 2004; R. Hickel, Siskiyou County Planning Department, in litt. 2005). However, one private property owner has indicated an interest in erection of cell towers on potential C. persistens habitat (Fish and Wildlife Service, in litt. 2001). None of the private property owners contacted in 2001 had immediate plans for development in the area.

In 2005, Bureau of Land Management staff discovered that an unauthorized off-road vehicle trail had been established on the ridge above the Oregon population (Brad Tong, Bureau of Land Management, pers. comm. 2005). Brush had been removed from this new trail and flagging put up to mark the trail route. While direct destruction of Calochortus persistens plants has not occurred, the trail could result in increased access to the plants or introduction of exotic species by off-road vehicles. This unauthorized resource damage has been reported to law enforcement agents.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Knapp (1995) listed bulb collection as an occasional threat to this species. In 1979 and 1982, the Klamath National Forest reported that there was some evidence that C. persistens bulbs may have been removed on Federal lands (Knorr 1987). At present, horticultural theft is not known to be a significant threat to the California population (Julie Knorr, Klamath National Forest, pers. comm. 2002).

C. Disease or predation.

Deer, rodent, and insect herbivory is common and causes significant losses to leaves, buds, flowers, and fruits (Knorr 1987; Knapp 1996; Klamath-Siskiyou Wildlands Center 2001). In a 1995 to 2000 demographic study, no seeds matured in 4 out of 6 years, due in large part to predation on reproductive structures (Klamath-Siskiyou Wildlands Center 2001).

D. The inadequacy of existing regulatory mechanisms.

Calochortus persistens was listed in July 1982 by the State of California Fish and Game Commission as a rare species under the California Native Plant Protection Act (CNPPA) (Chapter 10, section 1901 et seq., California Fish and Game Code, and Title 14, California Code of Regulations 670.2). The CNPPA prohibits the taking, possessing, or selling of plants listed under this act, though there are exceptions to these prohibitions. In the past, the CNPPA has not provided adequate protection for plants listed under this statute from the impacts of habitat modification, land use changes, or invasion of habitat by exotic species.

The Forest Service has issued “Botanical Investigation and Management Guidelines for Calochortus persistens” (Knorr 1987) and has designated 40 ha (1000 ac) as Special Habitat for C. persistens (Klamath National Forest 1995). While the management goals set forth in the

Klamath National Forest Land and Resource Management Plan must be implemented, at the time C. persistens was added to the candidate list, there were no funds directly allocated to specific projects to reduce or eliminate dyer's woad (Sue Stresser, Klamath National Forest, pers. comm. 2002). In their petition to list this species, Klamath-Siskiyou Wildlands Center (2001) cited the fact that the management guidelines had not been implemented as one of the threats to survival for this species. Existing regulatory mechanisms have not protected C. persistens from existing threats and are inadequate to ensure this species' survival and recovery.

E. Other natural or manmade factors affecting its continued existence.

Unpublished data from a five-year demographic study conducted within thirteen 5-meter by 0.5-meter transects showed that none of the seedlings established in 1995 survived to 2000, suggesting no survival for an entire year's reproduction (Klamath-Siskiyou Wildlands Center 2001). The reproductive rate based on conditions from 1995 to 1996 was high compared to those averaged over the period from 1995 to 2001 (Knapp undated). However, even during the period from 1995 to 1996, when the reproductive rate appeared to be relatively high, only 20 percent of buds produced in transects matured to distribute seeds (Knapp 1996). There is no evidence of asexual reproduction by bulbils or bulblets and plants don't begin to flower until 8 to 10 years of age (Klamath-Siskiyou Wildlands Center 2001).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED:

In 1982, Klamath National Forest issued its "Botanical Investigation and Management Guidelines for Calochortus persistens" (Knorr 1987). These guidelines prohibit new ground-disturbing activities within 100 m (330 ft) of the Gunsight-Humbug Ridge, restrict vehicles to existing roads, prohibit the use of heavy equipment to maintain fuel breaks, prohibit implementation of activities before a Forest Service botanist is consulted, require installation of a deer-proof fence around a 0.8 ha (2 ac) area, and require monitoring of C. persistens populations. The Klamath National Forest Land and Resource Management Plan established a 40 ha (1000 ac) Special Habitat Management Area for this species where currently known and newly discovered C. persistens habitat must be managed to maintain a viable population and where non-native species must be reduced or eliminated. The Klamath National Forest has conducted population surveys and funded a one-year demographic study on this species. In 1990, Forest Service staff attempted a small dyer's woad removal project. As a result of this test, the Forest Service concluded that hand removal is too time consuming and effort-intensive to be a viable eradication option (J. Knorr, Klamath National Forest, pers. comm. 2002).

The Klamath National Forest and Fish and Wildlife Service have begun work to develop a conservation strategy for this species. In 2003, under contract with the Fish and Wildlife Service, Klamath National Forest staff mapped the entire known range of C. persistens in California, using Global Positioning System technology (Klamath National Forest 2004). The extent of dyer's woad invasion adjacent to and within C. persistens populations was mapped on paper. During the mapping effort, dyer's woad was manually removed from approximately 10 percent of C. persistens habitat, where infestation was sparse and where disturbance to C. persistens plants could be avoided. Dyer's woad was also manually clipped along 5.6 km (3.5 mi) of the road that provides access to the Gunsight-Humbug Ridge. In 2003, the roads and

areas around radio towers and buildings on the Mahogany Point administrative site were manually treated for dyer's woad by clipping. Plots for different weed treatments were established at this administrative site in 2003 and weed treatment experiments were carried out in 2004 (Klamath National Forest 2005) and 2005 (M. Knight, Klamath National Forest, pers. comm. 2005). In 2004 and 2005, work continued with the Klamath National Forest on the development of a conservation agreement for C. persistens. In addition, manual treatment of dyer's woad along the Gunsight-Humbug Ridge Road was completed: 8.8 km (5.5 mi) in 2004 and 9.6 km (6 mi) in 2005. In 2005, Dyer's woad was manually removed from about 2.2 ha (5.5 ac) of land adjacent to occupied C. persistens habitat.

SUMMARY OF THREATS:

The combination of restricted range, extremely low numbers (possibly only five plants) in one of two disjunct populations, poor competitive ability, short seed dispersal distance, slow growth rate, low seed production, apparently poor survival rates in some years, and competition from exotic plants threaten the continued existence of this species.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5*
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

___ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed? Yes

Rationale for listing priority number:

Magnitude:

The exotic weed, dyer's woad (Isatis tinctoria) is a germination inhibitor that has either invaded or surrounded Calochortus persistens populations in approximately 90 percent of this species' known habitat in California. Where dyer's woad is present, up to one to two percent of the habitat is covered by dyer's woad. Unaffected portions (approximately 10 percent of the habitat

in California) can persist if no disturbance (e.g. fire suppression actions or off-road vehicle use) occurs. However, this area is one where the potential for fire suppression activities (e.g., fire line construction) is high and the resulting habitat destruction and disturbance resulting in dyer's woad invasion is high. Therefore, the magnitude of this threat is high.

Immediacy:

One of two known disjunct populations is represented by only five plants. In California, where dyer's woad has affected Calochortus persistens, infection levels do not exceed two percent of the vegetation cover. The likelihood that a large proportion of the California range would be affected by disturbance at the same time is low. Therefore, the immediacy of this threat is non-imminent.

Is Emergency Listing Warranted? At this time emergency listing is not warranted. The Fish and Wildlife Service and Forest Service have entered into the fourth year of an agreement to clip dyer's woad along the roadsides that allow access to the California population. A cooperative agreement is being drafted between the Fish and Wildlife Service and the Forest Service that when implemented, will reduce or remove the threats to Calochortus persistens.

DESCRIPTION OF MONITORING:

The Yreka Fish and Wildlife Office has contracted with the Klamath National Forest to develop a conservation strategy for Calochortus persistens on Federal lands and to implement recovery actions for this species. Therefore, we have met frequently to discuss the draft conservation agreement, have participated in field surveys, and assisted with exotic weed treatments. As we draft the conservation agreement, we continue to gather and review pertinent literature. On May 16, 2005, we received an accomplishment report on activities that the Klamath National Forest completed in 2004 (Klamath National Forest 2005). Each year since this species was petitioned for listing, we have contacted the Siskiyou County Planning Department so that we can be apprised of any developments that are being planned for private lands where C. persistens occurs. Finally, we have contacted the Bureau of Land Management botanist to find out about the population status in Oregon. Therefore, we are monitoring both population status and threats across the range of this species.

COORDINATION WITH STATES:

State of California staff have indicated that Fish and Wildlife Service information for this species is current (Pete Figura, in litt. 2005). The State of Oregon has not been afforded the opportunity to provide information or comments.

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Personal Communications:

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Knight, Marla. Klamath National Forest, Scott/Salmon Ranger District, Fort Jones, California.

Knorr, Julie. Klamath National Forest, Scott River/Oak Knoll Ranger District, Fort Jones, California.

Jarecki, John. Siskiyou County Planning Department, Yreka, California.

Stresser, Sue. Klamath National Forest, Yreka, California

Tong, Brad. Bureau of Land Management, Medford District, Medford, Oregon.

Date of annual review:
Conducted by: